R E P O R T R E S U M E S

ED 014 742 CG 000 673

A DESCRIPTION OF COLLEGE FRESHMEN--I. STUDENTS WITH DIFFERENT CHOICES OF MAJOR FIELD.

BY- ABE, CLIFFORD, HOLLAND, JOHN L.
AMERICAN COLLEGE TESTING PROGRAM, IOWA CITY, IOWA

REPORT NUMBER ACT-RR-3-MAY-65 PUB DATE MAY 65
EDRS PRICE MF-$0.25 HC-$2.24 54P.

DESCRIPTORS- *RESEARCH, ANALYSIS OF VARIANCE, *COLLEGE FRESHMEN, *STUDENT CHARACTERISTICS, *UNITS OF STUDY (SUBJECT FIELDS), *COLLEGE PROGRAMS, CAREER CHOICE, COLLEGE CURRICULUM, AMERICAN COLLEGE TESTING PROGRAM, AMERICAN COLLEGE SURVEY

COLLEGE FRESHMEN PLANNING TO MAJOR IN DIFFERENT FIELDS OF STUDY ARE DESCRIBED. THE SAMPLE STUDIED INCLUDED 12,432 COLLEGE FRESHMEN ENROLLED IN 31 INSTITUTIONS OF HIGHER EDUCATION DURING APRIL AND MAY 1964. THE AMERICAN COLLEGE SURVEY WAS USED TO ASSESS STUDENT CHARACTERISTICS. INCLUDED IN THIS SURVEY IS THE VOCATIONAL PREFERENCE INVENTORY, POTENTIAL ACHIEVEMENT SCALES, EXTRACURRICULAR ACHIEVEMENT RECORD, PRECONSCIOUS ACTIVITY SCALE, RANGE OF COMPETENCIES, INTERPERSONAL COMPETENCY SCALE, RANGE OF EXPERIENCE SCALE, INTELLECTUAL RESOURCES IN THE HOME SCALE, DOGMATISM SCALE, STUDENT ORIENTATION SURVEY, AND A FORM TO ASSESS OTHER INFORMATION SUCH AS PERSONAL DATA, EDUCATIONAL AND ECONOMIC ASPIRATIONS, LIFE GOALS, AND SELF RATINGS, MEANS AND STANDARD DEVIATIONS WERE COMPUTED FOR 117 STUDENT CHARACTERISTICS FOR EACH MAJOR FIELD WITH TEN OR MORE STUDENTS. USING SIMPLE ANALYSES OF VARIANCE, SIGNIFICANT RESULTS WERE OBTAINED FOR 52 STUDENT VARIABLES. MAJOR FIELDS WERE THEN GROUPED INTO 13 ACADEMIC AREAS AND TABLES PREPARED TO SHOW THE CHARACTERISTICS MOST DESCRIPTIVE OF THE MAJOR FIELDS COMPRISING THAT AREA. SINCE ANALYSIS OF THE TABLES SHOWS THAT STUDENTS WHO PLAN TO ENTER A FIELD DO ENTER THAT FIELD, THE RESULTS APPEAR TO HAVE SOME PRACTICAL VALUE. THIS IS ACT RESEARCH REPORT NO. 3, MAY, 1965. (SK)

ED014742

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ACT

RESEARCH REPORTS

A DESCRIPTION OF COLLEGE FRESHMEN

1. STUDENTS WITH DIFFERENT CHOICES OF MAJOR FIELD

May, 1965 No. 3

Clifford Abe
John L. Holland

CG 000 673

Published by Research and Development Division - American College Testing Program - P. O. Box 168, Iowa City, Iowa 52240

A Description of College Freshmen: I. Students with Different Choices of Major Field

Clifford Abe and John L. Holland

The selection of a major field is a decision faced by every college student. Although the process of making wise choices is incompletely understood, most people have assumed that satisfying choices require some matching of student characteristics and competencies with the demands of the prospective field of study. When a student's characteristics resemble those of the typical student in his prospective field, he is likely to feel at home and remain in his field. Conversely, incongruencies between a student and his field result in feelings of alienation and dissatisfaction and usually lead to a change of plans. These assumptions are plausible and receive some support from earlier studies (Darley and Hagenah, 1955); but because of their importance, they need a more complete empirical foundation.

The purpose of the present study is to report a description of college freshmen who plan to major in different fields of study. The descriptions of prospective majors are assumed to have several desirable properties: The descriptive variables are generally the product of simple, direct assessments of student characteristics so that they are easily interpreted by students, counselors, and faculty. The descriptions for single fields and for groups of fields are usually based on a large national sample of

college students so that the results are generally reliable as well as free of the special characteristics of prospective majors at individual colleges.

The Student Survey

The present study grew out of the American College Survey (Abe, Holland, Lutz, and Richards, 1965), a project conducted by the American College Testing Program to obtain a more complete account of the typical American college student and of the variation among students from college to college. To accomplish these tasks, a comprehensive assessment was administered to 12,432 college freshmen in 31 institutions of higher education in the months of April or May in 1964.

The following sections characterize the student sample, and the materials and scales contained in the student survey.

Student Sample

Several statistics characterize the student sample: seven per cent were enrolled in junior colleges, twelve per cent in four year undergraduate colleges, and eighty-one per cent in universities. About 15 per cent of these freshmen were students in private colleges, while 85 per cent were students in public colleges. About 95 per cent attended coeducational colleges. Finally, 20 per cent were enrolled in colleges in the Northeast, 31 per cent in colleges in the South, 20 per cent in colleges in the Midwest, 26 per cent in colleges in the Mountains and Plains states, but only 3 per cent in colleges on the West Coast.

The number of freshmen and the percentage of the freshman class

participating in the American College Survey varied greatly from college to college. At one extreme, 96 per cent of the Burlington Community College freshmen participated, while at the other Colorado State College submitted a selected sample of 22 per cent of their freshmen. Table 1 summarizes the rate of participation for each college.

Table 1

The Participating Colleges and the Percentage of Freshmen Who Responded to the American College Survey

College	State	Men	Women	% of Total Fresh. Class
Arkansas Polytechnic College	Arkansas	155	94	34
Baylor University	Texas	207	273	44
Black Hills Teachers College	South Dakota	102	74	46
Bloom Township Community College	Illinois	102	46	70
Burlington Community College	Iowa	135	72	96
California State College at Hayward	California	144	186	60
Carthage College	Wisconsin	33	89	44
Colorado State College	Colorado	62	172	22
Fairmont State College	West Virginia	187	152	76
Glassboro State College	New Jersey	178	529	80
Indiana State College	Indiana	233	333	28
Jamestown Community College	New York	77	83	64
Kansas State University	Kansas	641	511	73
Lyons Township Junior College	Illinois	50	53	57
Mount Mercy College	Pennsylvania	--	150	91
New Mexico State University	New Mexico	198	81	29
Plymouth State College	New Hampshire	59	115	72
Snow College	Utah	82	63	49
Southeastern State College	Oklahoma	143	107	62
Southern Connecticut State College	Connecticut	147	398	77

Table 1 (cont.)

College	State	Men	Women	% of Total Fresh. Class
Southern Illinois University	Illinois	762	363	33
Springfield College	Massachusetts	145	85	54
Swarthmore College	Pennsylvania	69	50	44
University of Alabama	Alabama	429	387	43
University of Kentucky	Kentucky	711	616	63
University of North Dakota	North Dakota	226	272	49
University of Tennessee	Tennessee	597	474	47
Wesleyan University	Connecticut	287	--	94
Westbrook Junior College	Maine	--	169	81
William Carey College	Mississippi	30	47	47
William Jewell College	Missouri	98	99	81
Total Students		6289	6143	

The Student Survey

The assessment device used to estimate various student characteristics was called the American College Survey (1964). The American College Survey is a booklet which contains a letter explaining the purpose of the survey, and 1004 items which were concerned with a student's interests, potential for various kinds of achievement, attitudes, and other orientations. The following sections summarize our knowledge of the scales and assessment devices contained in the American College Survey.

Vocational Preference Inventory (Fifth Revision). This personality and interest inventory is composed only of occupational titles (Holland, 1958). To take the inventory, a student indicates which occupations he likes and dislikes. Scores on only the following scales were used for this

study: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-Control, Aggressive, Masculine, Status, and Acquiescence. Reliabilities (Kuder-Richardson 20) ranged from .57 to .89 for 6289 male college freshmen and from .50 to .89 for 6143 females.

For the present descriptive study, it is useful to interpret the VPI only as an inventory of vocational interests. The VPI scales used and their "interest" interpretations are as follows:

Scale	Preference for:
Realistic	technical and skilled trades
Intellectual	scientific occupations
Social	teaching and helping occupations
Conventional	clerical occupations
Enterprising	supervisory and sales occupations
Artistic	artistic, musical, and literary occupations
Self-Control	aversion to occupations involving risk of physical injury, adventure, and danger
Aggressive	occupations of great power and status such as UN Diplomat, College President, Prosecuting Attorney
Masculine	occupations typical of men

Status	prestigeful occupations such as Lawyer, Doctor, Business Executive
Acquiescence	number of preferred occupations

Potential Achievement Scales. In an earlier study of National Merit Finalists (Holland and Nichols, 1964), Potential Achievement Scales were constructed empirically by sex for the prediction of six kinds of extracurricular achievement: art, music, writing, science, dramatics, and leadership. The students falling in the upper and lower 27 per cent on checklists of accomplishments for these fields in high school were compared for their preferences for 273 daily activities, hobbies, reading habits, school subjects, and sports. The upper and lower 27 per cent were drawn from samples of 500 boys and 500 girls. Typical items included working on guns, building scientific equipment, playing chess, going to a public library, giving talks, collecting rocks, playing charades, and drawing cartoons. In the first study of these scales only the 15 most discriminating items were used. Item-criterion correlations ranged from .24 to .80.

In the present study, all scales were lengthened by adding 3 to 14 items per scale. These additions were intended to increase the reliability and perhaps the validity of the Potential for Achievement Scales. The lengthened scale reliabilities (Kuder-Richardson) ranged from .72 to .84 for men and from .65 to .81 for women.

Extracurricular Achievement Record. The checklists of extracurricular accomplishment for the high school years were used earlier by Holland and Nichols (1964) and include the following areas: art, music, literature, dramatic arts, leadership, and science. The score on each scale is simply the number of accomplishments checked. Students with high scores on one or more of these simple scales have attained a high level of accomplishment which is assumed to require one or more of the following characteristics: complex skills, long term persistence, and originality. The reliabilities (K-R 21) for individual records of accomplishment range from .48 to .75 for men and from .58 to .86 for women for National Merit Finalists. In a diverse group of college freshmen, the reliabilities (K-R 20) ranged from .72 to .84 for men and from .65 to .81 for women.

Preconscious Activity Scale. This scale is an a priori scale developed to measure Kubie's (1958) notion of preconscious activity as a process in creative performance (Nichols and Holland, 1963). The Preconscious Activity Scale is a 38 item true-false scale with reliabilities (K-R 20) of .72 and .68 for male and female college freshmen. The predictive validities of this scale and its concurrent relationships with originality and interest measures imply that the Preconscious Activity Scale should be interpreted as an originality measure, especially in the fields of art, literature, and music (Nichols and Holland, 1963).

Range of Competencies. Using a list of 143 activities, students

checked the activities which they claimed that they could do well or competently. The assumption underlying these scales is that a large number of competencies is conducive to achievement generally and that competencies in a particular field are conducive to achievement in the same field. Typical items from this list included: I have a working knowledge of Roberts' Rules of Order, I can dance, I am a good cook, I can make jewelry, I can read blueprints, I can read Greek, I can operate a tractor, I can use logarithm tables, etc. The number of activities checked equals a student's range of competencies or total number of competencies. Competencies were categorized by three judges into several areas of competence: scientific, technical, governmental, athletic, business, social and educational, homemaking, arts, leadership and sales, and foreign language. Students were then scored for each kind of competency. The reliability (K-R 20) for the total number of competencies claimed was .94 and .93 for male and female college freshmen; the reliability for the special competency scales ranged from .35 to .87 and from .11 to .85 for men and women. The very low reliabilities for a few scales appear to result from the small number of items in such scales.

Interpersonal Competency Scale. This twenty item, a priori scale was modeled after the work of Foote and Cottrell (1955), who defined interpersonal competence as "acquired ability for effective interaction," and who outlined a program of research to study this concept. Scale

items simply poll the subject for those factors which Foote and Cottrell believe to be conducive to, or typical of interpersonal competency--good health, social experience and competencies, positive self-regard. The reliability (K-R 20) of the Interpersonal Competency Scale for groups of 6289 male and 6143 female college freshmen was .69 and .67 respectively.

Range of Experience. The assumption underlying the development of this scale is that breadth of experience is conducive to achievement. Students checked their experiences from a list of 76 items. Typical examples included: museum, factory, gambling casino, summer camp, mental hospital, sports car race. This scale is scored by simply counting the number of experiences checked. The reliability (K-R 20) was .92 and .90 for male and female college freshmen.

Intellectual Resources in the Home. Students checked those things they have in their homes from a list of 39 items. The assumption underlying the construction of this scale is that many as opposed to few environmental resources are conducive to achievement. Typical items included: an encyclopedia set, tape recorder, sculpturing tools, sewing machine, power tools, library of more than 200 books. The number of items checked became a student's score for this variable. The reliability (K-R 20) of this scale was .81 for male college freshmen and .78 for female college freshmen.

Dogmatism Scale. This scale, developed by Rokeach to measure dogmatic and rigid thinking, consists of 40 true-false items dealing with

beliefs and attitudes. (The first version by Rokeach is in multiple choice form.) The reliability (K-R 20) for 6289 male college freshmen was .77 and for 6143 female college freshmen was .75.

Student Orientation Survey, Form C. Farber and Goodstein (1964) developed four a priori scales to assess the student orientations implied in Trow's student typology (1960). These scales are Academic, Collegiate, Non-Conforming, and Vocational. The a apriori scales were revised by an internal consistency item analysis to develop homogeneous, 10-item scales. Reliabilities (K-R 20) ranged from .39 to .45 for male college freshmen and from .36 to .50 for females.

Other Descriptive Information. Students were polled for their educational and economic aspirations, their life goals, and their self-ratings. They were also asked to indicate their choice of vocation and field of training, and to provide background information. Their high school grades and ACT scores were available from college records.

Students indicated the degree to which 35 different life goals and achievements were "essential, very important, somewhat important, or of little importance" (for example, being a religious person, making a contribution to scientific knowledge, being happy and content).

Using a list of 31 traits and abilities such as originality, scholarship, and conservatism, students rated their personal traits and abilities on a four-point scale--top 10%, above average, average, and below average.

Table 2 summarizes the reliability coefficients (K-R 20) for all descriptive scales and indicates the number of items in each scale. Generally, the scales possess moderate to high homogeneity. Scales with low coefficients are usually brief scales or scales with marked heterogeneity of content.

Table 2

Kuder-Richardson Reliabilities for the Descriptive Scales of the American College Survey

Scale	No. of Items		Reliability	
	Men	Women	Men	Women
1. Realistic	14	14	.85	.77
2. Intellectual	14	14	.89	.89
3. Social	14	14	.84	.82
4. Conventional	14	14	.87	.83
5. Enterprising	14	14	.83	.76
6. Artistic	14	14	.88	.88
7. Self-Control	14	14	.86	.85
8. Aggressive	14	14	.84	.83
9. Masculine	14	14	.57	.50
10. Status	14	14	.71	.60
11. Acquiescence	30	30	.76	.76
12. Leadership Potential	29	20	.86	.77
13. Literary Potential	18	20	.84	.72
14. Artistic Potential	20	24	.79	.85
15. Scientific Potential	23	24	.81	.80
16. Musical Potential	18	21	.87	.74
17. Dramatic Arts Potential	18	23	.77	.82
18. Range of Experience	76	76	.92	.90
19. Intellectual Home Resources	39	39	.81	.78
20. Scientific Achievement	15	15	.80	.81
21. Leadership Achievement	14	14	.72	.65
22. Dramatic Arts Achievement	13	13	.75	.72
23. Artistic Achievement	12	12	.84	.81

Table 2 (cont.)

Scale	No. of Items		Reliability	
	Men	Women	Men	Women
24. Literary Achievement	8	8	.73	.70
25. Musical Achievement	15	15	.84	.77
26. Total Competencies	143	143	.94	.93
27. Scientific Competency	11	11	.70	.67
28. Technical Competency	23	23	.83	.76
29. Government & Social Studies Competency	2	2	.57	.54
30. Athletic Competency	11	11	.71	.70
31. Business & Clerical Competency	5	5	.48	.38
32. Social & Educational Competency	13	13	.78	.74
33. Homemaking Competency	24	24	.86	.85
34. Arts Competency	34	34	.87	.85
35. Leadership & Sales Competency	12	12	.80	.79
36. Foreign Language Competency	6	6	.35	.11
37. Preconscious Activity (Originality)	38	38	.72	.68
38. Dogmatism	40	40	.77	.75
39. Academic Type	10	10	.45	.42
40. Vocational Type	10	10	.39	.36
41. Non-Conformist Type	10	10	.42	.43
42. Collegiate Type	10	10	.45	.50
43. Interpersonal Competency	20	20	.69	.67

Note. --This table is based on the total student samples of 6289 men and 6143 women.

Fields of Study and Prospective Students

The fields of study and the number of students planning to major in each field are shown in Table 3. Fields with less than ten prospective students were eliminated from further study. Similarly, students who were undecided or who gave no response or unclassifiable responses were omitted.

Table 3

The Distribution of Students by Anticipated Major Field of Study

Major Field	Men	Women	Major Field	Men	Women
Accounting	273	44	English, Creative Writing	50	69
Administration and Supervision	8	2	English Education	88	342
Aeronautical Engineering	68	6	Experimental and General Psych.	28	28
Agricultural Science	193	18			
Anthropology	10	5			
Architecture	78	5	Farming	26	0
Art	56	108	Finance	76	8
Art Education	24	84	Foreign Language Education	18	103
Astronomy, astro-physics	10	2	Foreign Service	6	9
			Forestry	90	1
Bio-chemistry	23	4			
Biology	134	98	General Humanities	20	23
Botany	15	7	General Social Sciences	23	34
Business Education	24	94			
			Geography	19	6
Chemical Engineering	80	3	Geology, geo-physics	23	3
Chemistry	144	42			
Civil Engineering	171	5			
Clerical	13	73			
Clinical Psychology	45	45	History	161	83
Counseling & Guidance	22	71	History Education	190	138
			Home Economics	6	235
Dentistry	95	35	Home Economics Education	3	139
Drama	18	18	Housewife	0	26
Economics	37	6			
Education, General and Other	28	31	Industrial Arts Education	56	0
Education of Exceptional Children	12	121	Industrial Engineering	32	0
Educational Psychology	16	41	Industrial & personnel psychology	16	5
Electrical Engineering	229	2			
Elementary Education	103	1353	Journalism, Radio-TV, Communication	54	55
Engineering, General and Other	99	4			
Engineering Science	42	2			

Table 3 (cont.)

Major Field	Men	Women	Major Field	Men	Women
Law	183	24	Other health fields	19	43
Library Science	1	19			
Literature	28	48	Pharmacy	45	10
			Philosophy	10	4
Management	339	27	Physical Education,		
Marketing	55	11	Rec., Health	289	235
Mathematics,			Physical Science,		
Statistics	123	71	General & Other	12	2
Math Education	160	133	Physical Therapy	7	25
Mechanical			Physics	79	10
Engineering	143	1	Physiology	17	7
Medical Technology	8	74	Political Science	139	55
Medicine	255	76	Public Admini-		
Metallurgical			stration	14	1
Engineering	15	0	Public Relations,		
Metallurgy	2	0	Advertising	25	8
Meteorology	0	2	Purchasing	8	37
Military Science	28	1			
Modern Foreign			Sales	45	22
Language	11	88	Secretarial		
Music	48	58	Science	1	249
Music Education	61	68	Social Work	15	84
			Sociology	33	74
Natural Science			Speech	14	35
Education	64	27			
No near equivalent			Theology, religion	36	11
in list	276	241	Trade & Industrial		
Not full-time & not			Education	29	2
housewife	1	4			
Nursing	6	285	Undecided or don't		
			know	337	229
Oceanography	5	2			
Other Biological			Veterinary		
Sciences	38	24	Medicine	110	15
Other Business &					
Commercial	48	20	Zoology	44	29
Other Fine & Applied					
Arts	4	10			

Note. --Samples of less than 10 for either sex were not used for this study; categories which do not represent specific fields were also omitted: "undecided, no near equivalent in list."

For each major field enrolling ten or more students (79 fields for men; 60 fields for women) the mean and standard deviation were computed for 117 student characteristics. It was assumed that the student characteristics significantly differentiated among the major fields. A partial test of this assumption was made by computing simple analyses of variance for 53 of the 117 student variables; statistically significant results were obtained for both sexes for 52 of these 53 variables. Only the self-rating of "self-sufficiency" failed to differentiate among major fields.

Rather than report all possible statistically significant findings, it was decided to report only the extreme findings. For this purpose, the fields with the highest and lowest means on each of the 117 characteristics were identified. A summary of these "extreme" characteristics was prepared for each major field. For each field the summary identified those characteristics for which students, planning a given major, averaged higher or lower than students planning any other major.

The major fields were then grouped into 13 conventional academic areas: physical sciences, biological sciences, humanities, social sciences, agriculture, business and administration, education, political science and law, health professions, engineering, creative arts, vocational and trade, and military science. For each academic area, a table was prepared to show the characteristics which were most descriptive of the major fields in that area.

The results are summarized in Tables 4 through 16. Each table

combines the characterizations of several related majors. While a given entry in a table applies only to a single major field in the group, it is assumed that the classification scheme is sufficiently homogeneous to permit generalization to all majors in the group. Since this assumption is not always tenable, a problem which most a priori classifications face, the following descriptions contain some inappropriate classifications and concomitant descriptive error.

The characteristics of students planning to major in each group of fields are summarized below.

Physical Sciences (astronomy, astrophysics, chemistry, physics, geography, geology, geophysics, mathematics, statistics, physical science, general and other)

When we look in Table 4 and review the findings literally, they suggest that men planning to major in the physical sciences have scientific interests, possess scientific potential, and have a record of scientific accomplishment in high school. They rate themselves, relative to their peers, as high on drive to achieve, math ability, scientific ability, intellectual self-confidence, and research ability. The following life goals and aspirations are important to potential physical scientists: inventing a useful product, becoming an authority in a special subject in their field, making their parents proud, making theoretical and technical contributions to science, and keeping in good physical condition.

In contrast, future male students in the physical sciences have

little interest in business, and few business and clerical competencies. They think of themselves as poor athletes, having little understanding of others, being shy and inexpressive, and lacking in cheerfulness and social self-confidence. They regard the following life goals as unimportant: following a formal religious code, being self-sufficient, producing good artistic work, becoming an accomplished musician, becoming an expert in finance and commerce, being a good spouse or parent, finding a real purpose in life, and being active in religious affairs.

Women aspiring to the physical sciences show a similar pattern of personal characteristics. Women are also likely to have lower psychosexual status; that is, they are more apt to be single, to be unengaged, to date different people, or to be dateless. Compared with women in other fields, they are more concerned about their future career than marriage.

Table 4

Student Characteristics associated with

the Choice of Physical Sciences

High Means	
Men	Women
Scientific Potential	Scientific Potential
Scientific Achievement	Scientific Achievement
Academic Type	Academic Type
SR - mathematical ability	SR - mathematical ability
SR - scientific ability	SR - scientific ability
SR - research ability	SR - research ability
G - inventing or developing a useful product or device	G - inventing or developing a useful produce or device
G - theoretical contribution to science	G - theoretical contribution to science

Table 4 (cont.)

High Means	
Men	**Women**
G - technical contribution to science	G - technical contribution to science
Intellectual (VPI)	Scientific Competency
SR - drive to achieve	SR - scholarship
SR - intellectual self-confidence	SR - independence
G - authority on special subject in my field	G - meaningful philosophy of life
G - making parents proud	G - exciting and stimulating activities
G - good physical condition	Satisfaction with College Choice

Low Means	
Men	**Women**
SR - sociability	SR - sociability
SR - cheerfulness	SR - cheerfulness
SR - social self-confidence	SR - social self-confidence
G - good spouse	G - good spouse
G - good parent	G - good parent
Enterprising (VPI)	Leadership Potential
Business and Clerical Competency	SR - popularity
SR - athletic ability	G - making sacrifices for others
SR - understanding of others	G - becoming a community leader
SR - speaking ability	G - avoiding hard work
SR - self-control	Psycho-Sexual Status
SR - expressiveness	Importance of Finding a Suitable Mate
G - following formal religious code	
G - self-sufficient	
G - producing good artistic work	
G - becoming accomplished musician	
G - expert in finance and commerce	
G - finding a real purpose in life	
G - being active in religious affairs	

Note. --On this and succeeding tables G = life goal or aspiration and SR = self-rating.

Biological Sciences (biology, bio-chemistry, botany, physiology, zoology, other biological fields)

The characteristics which differentiate the potential biological scientist from students in other major fields (Table 5) were few in number and relatively unclear in pattern. Both men and women regarded social welfare activities as unimportant as did the potential physical scientists, but the remaining findings did not hold for both sexes.

Table 5

Student Characteristics associated with

the Choice of Biological Sciences

High Means	
Men	Women
Realistic (VPI)	SR - practical-mindedness
Range of Experiences	G - finding real purpose in life
Intellectual Home Resources	
Scientific Competency	
SR - conservatism	
G - avoiding hard work	

Low Means	
Men	Women
SR - writing ability	G - making parents proud
G - becoming happy and content	G - expert in finance and commerce
G - influential in public affairs	
G - becoming mature and well-adjusted	

Engineering (aeronautical, civil, chemical, electrical, engineering science, industrial, mechanical, metallurgical, general and other)

The results for potential engineering students in Table 6 are consistent with previous studies and the stereotype of the engineer. Here he is characterized by his mechanical interests, his vocational orientation to college life, his desire to relax and enjoy life, and his claim of high mechanical ability. He has few social interests, and low artistic and literary achievement; he also does not aspire to write good fiction or to be well liked.

Table 6

Student Characteristics associated with

the Choice of Engineering

High Means (Men)
Masculine (VPI)
Vocational Type
SR - mechanical ability
G - having time and means to relax and enjoy life
Low Means (Men)
Social (VPI)
Artistic Achievement
Literary Achievement
G - writing good fiction
G - being well-liked

Health Professions (dentistry, medicine, nursing, pharmacy, physical therapy, veterinary medicine, medical technology, other health fields)

In Table 7, men interested in the health professions as a major are high on leadership achievement, total competencies, homemaking

competencies, and dogmatism. They expect to have a high income, and a high level of education, and the goal of being successful in their own business is important to them.

Women interested in the health professions in comparison with women planning to major in other fields see themselves as being more realistic, aggressive, masculine, and acquiescent. They feel that they have more drive to achieve than others. They are interested in being self-sufficient and being good parents.

Women in the health professions also see themselves as lacking in self-control; being low in literary or musical achievement; having few athletic, business and clerical, and social and educational competencies. They lack non-conforming and collegiate orientations, and they are low in interpersonal competency. Their expected vocational achievement in comparison with other women is low. They rate themselves low on athletic ability, understanding of others, speaking and writing ability, intellectual self-confidence, perseverance, popularity with the opposite sex, sense of humor, physical health, and sensitivity to the needs of others. They think that the following goals are unimportant: being happy and content, being an authority on a special subject in their field, following a formal religious code, having the time and means to relax and enjoy life, writing good fiction, being well-liked, being engaged in exciting and stimulating activities. Finally, women interested in the health professions tend to come from smaller high schools.

In general, these women seem to have few of the typical feminine characteristics--they claim few interests or competencies in cultural and social affairs; in addition, they seem less confident than women in other fields--they are acquiescent and rate themselves low in a variety of characteristics.

Table 7

Student Characteristics associated with

the Choice of Health Professions

High Means	
Men	Women
Leadership Achievement	Realistic (VPI)
Total Competencies	Aggressive (VPI)
Homemaking Competencies	Masculine (VPI)
Dogmatism	Acquiescence (VPI)
Expected Income	SR - drive to achieve
Highest Level of Education	G - self-sufficient
G - successful in own business	G - good parent
Low Means	
Men	Women
Satisfaction with college choice	Self-Control (VPI)
	Literary Achievement
	Musical Achievement
	Athletic Competency
	Business and Clerical Competency
	Social and Educational Competency
	Non-Conformist Type
	Collegiate Type
	Interpersonal Competency
	Expected Vocational Achievement
	SR - athletic ability
	SR - understanding of others
	SR - speaking ability

Table 7 (cont.)

Low Means	
	Women
	SR - writing ability
	SR - intellectual self-confidence
	SR - perseverance
	SR - popularity with the opposite sex
	SR - sense of humor
	SR - physical health
	SR - sensitivity to the needs of others
	G - happy and content
	G - authority on special subject in my field
	G - formal religious code
	G - time and means to relax and enjoy life
	G - writing good fiction
	G - being well-liked
	G - exciting and stimulating activities
	Size of the High School Class

Agriculture (agricultural science, forestry, farming)

In Table 8, the choice of agricultural fields by men is associated with low artistic interests, passivity, narrow range of vocational outlook, low scientific achievement, and graduation from a small high school. The potential agricultural major believes he has a poor sense of humor, and does not think the following goals are important: developing a meaningful philosophy of life, being well read, obtaining awards or recognition, avoiding hard work, and engaging in exciting and stimulating activities.

For women, agricultural choices are associated with many technical competencies and high self-ratings of mechanical ability. Women also

have low status interests and have little concern with such goals as: being influential in public affairs, becoming a mature and well-adjusted person, and keeping up-to-date politically.

Much of this description appears congruent with our knowledge of people from rural backgrounds: hard workers, less concern with status than urban residents, less interest in artistic matters and political affairs.

Table 8

Student Characteristics associated with the Choice of Agriculture

High Means	
Men	Women
	Technical Competency
	SR - mechanical ability
Low Means	
Men	Women
Status (VPI)	Status (VPI)
Artistic (VPI)	G - influential in public affairs
Aggressive (VPI)	G - mature and well-adjusted person
Scientific Achievement	G - up-to-date politically
Dramatic Arts Achievement	
SR - sense of humor	
G - meaningful philosophy of life	
G - being well-read	
G - obtaining awards or recognition	
G - avoiding hard work	
G - exciting and stimulating activities	
Size of High School Class	

Education (elementary, English, foreign language, history, natural science, mathematics, physical, recreational, health, exceptional children, general and other)

Men planning to major in this area are high in foreign language competency (probably holds only for students with language interests), athletic ability, physical energy, and physical health. Being an outstanding athlete is an important goal for them, a finding which probably holds largely for physical education majors. They are low on intellectual interests, scientific competency, technical competency, and scholarship. They think that becoming an accomplished musician, producing good artistic work and having executive responsibility for the work of others are relatively unimportant goals.

The women present a similar pattern with the rather puzzling exception that intellectual interests are high rather than low. This finding probably holds only for natural science majors.

Table 9

Student Characteristics associated with

the Choice of Education Professions

High Means	
Men	Women
SR - athletic ability	SR - athletic ability
SR - physical energy	SR - physical energy
SR - physical health	SR - physical health
G - outstanding athlete	G - outstanding athlete
Foreign Language Competency	Intellectual (VPI)

Table 9 (cont.)

Men	Women
High Means	
	Status (VPI) Athletic Competency G - good physical condition
Low Means	
Intellectual (VPI) Scientific Competency Technical Competency SR - scholarship G - becoming a community leader G - good artistic work G - executive responsibility	G - accomplished musician

Social Sciences (counseling and guidance, educational psychology, clinical psychology, industrial and personnel psychology, experimental and general psychology, anthropology, sociology, social work, general social sciences)

The choice of the social sciences is associated with social interests, a non-conforming orientation to college life, and goals of becoming mature and well-adjusted, and becoming a good parent. Potential social science majors also tend to come from large high schools. The remaining student attributes in Table 10 do not hold for both sexes.

Table 10

Student Characteristics associated with

the Choice of Social Sciences

High Means	
Men	Women
Social (VPI)	Social (VPI)
Non-Conformist Type	Non-Conformist Type
G - mature and well-adjusted	G - mature and well-adjusted
G - good parent	G - good parent
Size of High School Class	Size of High School Class
Self-Control (VPI)	G - good spouse
Social & Educational Competency	
SR - popularity	
SR - understanding of others	
SR - sensitivity to the needs of others	
G - becoming a community leader	

Low Means	
Men	Women
Expected Income	Musical Potential
G - helping others	Artistic Achievement
G - accomplished in performing arts	SR - conservatism
G - authority on special subject in my field	SR - practical-mindedness
G - making parents proud	
G - making sacrifices for others	
G - good physical condition	
G - expert in finance and commerce	

Vocational and Trade (home economics education, business education, trade and industrial education, industrial arts education, library science, home economics, housewife)

Both sexes planning to enter vocational and trade fields regard becoming a good spouse as an important goal; both sexes lack literary, artistic, and dramatic arts potential and they report few foreign language competencies or achievements in leadership. This group is characterized by its almost explicit orientation toward marriage rather than career, an interpretation which is especially clear for women. They claim many homemaking competencies; they desire being happy and content, and becoming a good spouse and good parent. They see finding a suitable mate as an important goal in college attendance, and relative to other groups of students, they have the highest average psycho-sexual status score. Psycho-sexual status is defined here by a simple five step scale ranging from marriage, engaged, going steady, date different persons to don't date at all; the future vocational and trade students have a high average score, or they are more involved with the opposite sex than any of the other groups.

Table 11

Student Characteristics associated with

the Choice of Vocational and Trade Fields

High Means	
Men	Women
G - good spouse	G - good spouse
Acquiescence (VPI)	Homemaking Competency
Technical Competency	G - becoming happy and content
	G - good parent

Table 11 (cont.)

Men	Women
High Means	
	Psycho-Sexual Status
	Finding Suitable Mate
Low Means	
Literary Potential	Literary Potential
Artistic Potential	Artistic Potential
Dramatic Arts Potential	Dramatic Arts Potential
Leadership Achievement	Leadership Achievement
Foreign Language Competency	Foreign Language Competency
Leadership Potential	Scientific Potential
Government and Social Studies Competency	Range of Experience
	Total Competencies
Arts Competency	Leadership and Sales Competency
SR - sensitivity to the needs of others	Expected Income
	SR - leadership
	SR - mechanical ability
	SR - drive to achieve
	SR - independence
	SR - perseverance
	SR - research ability
	SR - physical energy
	G - accomplished performer
	G - meaningful philosophy of life
	G - being well-read
	G - receiving awards or recognition

Business and Administration (management, clerical, sales, finance, marketing, purchasing, economics, public relations, advertising, accounting, public administration, secretarial science, other business and commercial)

Both sexes planning to enter business and administrative fields are

characterized by their clerical and persuasive interests. They claim many business and clerical competencies and they possess a collegiate orientation to higher education. They hope to become well-off financially, to become experts in finance or commerce, to be well liked, to become good parents, and to achieve executive responsibility. In contrast, both sexes have achieved little in science in high school, have rated themselves low on originality, and have reported a non-academic orientation to college life. They also rate themselves low on scholarship, acting ability, and they do not value the production of good artistic work.

The results in Table 12 reinforce some of the stereotypes of people in the business and administrative fields.

Table 12

Student Characteristics associated with

the Choice of Business and Administration

High Means	
Men	Women
Conventional (VPI)	Conventional (VPI)
Enterprising (VPI)	Enterprising (VPI)
Business and Clerical Competency	Business and Clerical Competency
Collegiate Type	Collegiate Type
G - well-off financially	G - well-off financially
G - being well-liked	G - being well-liked
G - good parent	G - good parent
G - executive responsibility	G - executive responsibility
G - expert in finance or commerce	G - expert in finance or commerce
Athletic Competency	Range of Experiences
SR - practical-mindedness	Leadership Achievement
G - becoming happy and content	Vocational Type

Table 12 (cont.)

High Means

Men	Women
G - following formal religious code	Expected Vocational Achievement
G - receiving awards or recognition	SR - understanding of others
G - self-sufficient	SR - conservatism
Satisfaction with College Choice	SR - perseverance
	G - making parents proud
	G - becoming a community leader
	G - good spouse
	G - successful in own business

Low Means

Men	Women
Scientific Achievement	Scientific Achievement
Preconscious Activity	Preconscious Activity
Academic Type	Academic Type
SR - scholarship	SR - scholarship
SR - scientific ability	SR - scientific ability
SR - acting ability	SR - acting ability
G - good artistic work	G - good artistic work
Scientific Potential	Intellectual (VPI)
Musical Potential	Artistic (VPI)
Musical Achievement	Acquiescence (VPI)
Total Competencies	Intellectual Home Resources
Athletic Competency	Dramatic Arts Achievement
Social and Educational Competency	Scientific Competency
Leadership & Sales Competency	Arts Competency
Interpersonal Competency	Highest Level of Education
Expected Vocational Achievement	SR - originality
SR - leadership	SR - artistic ability
SR - popularity	SR - aggressiveness
SR - drive to achieve	SR - self-control
SR - independence	SR - expressiveness
SR - practical-mindedness	G - becoming outstanding athlete
SR - intellectual self-confidence	G - self-sufficient
SR - perseverance	G - good physical condition
SR - popularity with opposite sex	G - real purpose in life

Table 12 (cont.)

Low Means	
Men	Women
SR - research ability G - theoretical contribution to science	Consultation with Professional Person

Political Science and Law

Men and women in these fields value being influential in public affairs and keeping up to date politically. Men appear to be more aggressive and concerned with their status than women, and women appear to have higher interpersonal competencies and more diverse competencies than men. Women also seek more education and income.

Table 13

Student Characteristics associated with the Choice of Political Science and Law

High Means	
Men	Women
G - influential in public affairs G - up-to-date politically	G - influential in public affairs G - up-to-date politically
Aggressive (VPI) Status (VPI)	Total Competencies Interpersonal Competency Expected Income Highest Level of Education SR - cheerfulness G - authority on special subject in my field

Table 13 (cont.)

Low Means	
Men	Women
Homemaking Competency	

Creative Arts (art, speech, music education, art education, drama, literature, English, creative writing, music, journalism, other fine and applied arts)

Students planning to enter artistic fields are a well defined group relative to most of the educational groups discussed earlier. Both sexes have artistic interests; leadership, literary, musical and dramatic arts potentials as well as artistic achievements and competencies. Both sexes conceive of themselves as original, having leadership ability, artistic, agressive, having speaking ability, self-controlled, having writing ability, acting ability, and a sense of humor. Their life goals also reflect their interest in the arts.

Table 14

Student Characteristics associated with

the Choice of Creative Arts

High Means	
Men	Women
Artistic (VPI)	Artistic (VPI)
Leadership Potential	Leadership Potential
Literary Potential	Literary Potential

Table 14 (cont.)

High Means

Men	Women
Artistic Potential	Artistic Potential
Musical Potential	Musical Potential
Dramatic Arts Potential	Dramatic Arts Potential
Dramatic Arts Achievement	Dramatic Arts Achievement
Artistic Achievement	Artistic Achievement
Literary Achievement	Literary Achievement
Musical Achievement	Musical Achievement
Arts Competency	Arts Competency
Leadership & Sales Competency	Leadership & Sales Competency
SR - originality	SR - originality
SR - sociability	SR - sociability
SR - artistic ability	SR - artistic ability
SR - aggressiveness	SR - aggressiveness
SR - speaking ability	SR - speaking ability
SR - self-control	SR - self-control
SR - writing ability	SR - writing ability
SR - social self-confidence	SR - social self-confidence
SR - sense of humor	SR - sense of humor
SR - acting ability	SR - acting ability
G - accomplished performer	G - accomplished performer
G - writing good fiction	G - writing good fiction
G - being well-read	G - being well-read
G - receiving awards or recognition	G - receiving awards or recognition
G - good artistic work	G - good artistic work
G - accomplished musician	G - accomplished musician
Interpersonal Competency	Intellectual Home Resources
SR - cheerfulness	Social and Educational Competency
SR - perseverance	Preconscious Activity
G - happy and content	Dogmatism
G - meaningful philosophy of life	SR - leadership
G - exciting and stimulating activities	SR - popularity
	SR - independence
	SR - expressiveness
	SR - intellectual self-confidence
	SR - popularity with opposite sex
	G - relaxing and enjoying life
	G - good spouse
	G - good parent
	G - finding real purpose in life

Table 14 (cont.)

Low Means

Men	Women
Masculine (VPI)	Masculine (VPI)
G - inventing or developing useful product or device	G - inventing or developing useful produce or device
G - technical contribution to science	G - technical contribution to science
SR - mechanical ability	Social (VPI)
SR - mathematical ability	Aggressive (VPI)
SR - artistic ability	Government and Social Studies Competency
SR - conservatism	Dogmatism
SR - physical energy	Vocational Type
G - up-to-date politically	G - well-off financially
	G - helping others who are in difficulty
	G - theoretical contribution to science
	G - active in religious affairs
	G - executive responsibility
	G - successful in own business
	Satisfaction with College Choice

Humanities (history, modern foreign language, philosophy, architecture, theology and religion, general humanities)

Students categorized as seeking fields in the humanities do not form a well-defined group. Only a few traits are identical for men and women: helping others, making sacrifices for others, being active religiously. Both sexes show little interest in realistic (mechanical and skilled trades) and conventional (clerical and business) vocations. The failure to attain a more reasonable concensus for humanities may be due to the variety of

fields now included in humanities.

Table 15

Student Characteristics associated with

the Choice of Humanities

High Means	
Men	Women
Government and Social Studies Competency	Government and Social Studies Competency
G - helping others	G - helping others
G - making sacrifices for others	G - making sacrifices for others
G - active religiously	G - active religiously
Consultation with Professional Person	Consultation with Professional Person
Preconscious Activity	Self-Control (VPI)
Non-Conformist Type	Foreign Language Competency
Expected Vocational Achievement	SR - conservatism
SR - leadership	SR - sensitivity to the needs of others
SR - scholarship	G - becoming a community leader
SR - independence	G - following a formal religious code
SR - expressiveness	G - avoiding hard work
SR - popularity with opposite sex	G - good spouse
G - good parent	
G - finding real purpose in life	
Psycho-Sexual Status	

Low Means	
Men	Women
Realistic (VPI)	Realistic (VPI)
Conventional (VPI)	Conventional (VPI)
Acquiescence (VPI)	Enterprising (VPI)
Range of Experience	Technical Competency
Intellectual Home Resources	SR - mathematical ability
Homemaking Competency	
Dogmatism	
Vocational Type	

Table 15 (cont.)

Low Means	
Men	Women
Non-Conformist Type	
Collegiate Type	
SR - artistic ability	
SR - aggressiveness	
SR - physical health	
G - well-off financially	
G - outstanding athlete	
G - formal religious code	
G - having time to relax and enjoy life	
G - good parent	
G - success in own business	
Psycho-Sexual Status	
Consultation with Professional Person	
Finding Suitable Mate	

Military Science

The traits attributed to students in military science indicate that such students regard the finding of a suitable mate in college as an important goal. The "low" means imply that military science aspirants are impulsive, have low educational aspirations and see themselves as having little originality.

Table 16

Student Characteristics associated with the Choice of Military Science

High Means (Men)
Importance of Finding Suitable Mate

Table 16 (cont.)

Low Means (Men)

Self-Control (VPI)
Highest Level of Education
SR - originality

Individual Major Fields

Another way of looking at the information about students and their prospective major fields, is to identify the individual major fields which are highest and lowest on each of the 117 student variables. Table 17 was formed to show these relationships. For example, realistic interests (skilled trades and technical interests) are highest for future physiologists and lowest for future philosophy majors.

A review of this table generally lends validity to the meaning attributed to the various scales and ratings used in this study, and suggests an extensive number of hypotheses about students in different fields which can be examined in new research. Engineering majors have the most masculine interests; art education majors have the most feminine interests. On the average, bio-chemistry majors have the most intellectual resources in the home; theology and religion majors have the least. Social work majors have the most social and educational competencies; clerical majors have the least. Astronomy and astrophysics majors are highest on the academic orientation; public relations majors are lowest.

Table 17

The Major Fields with the Highest and Lowest

Mean Scores on 117 Variables

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
1. Realistic	Physiology	Philosophy	Vet. Medicine	Law
2. Intellectual	Physics	Educ. of Exceptional Children	Nat. Science Education	Sales
3. Social	Geography	Metal. Engr'ng	Counseling & Guidance	Other Fine & Applied Arts
4. Conventional	Accounting	Philosophy	Accounting	Theology, Religion
5. Enterprising	Public Relations	Astronomy, Astrophysics	Marketing	Theology, Religion
6. Artistic	Literature	Farming	Drama	Clerical
7. Self-Control	Educ'l Psychol.	Military Science	Theology, Religion	Vet. Medicine
8. Aggressive	Political Science	Farming	Vet. Medic.	Other Fine & Applied Arts
9. Masculine	Enginr'ng, Gen. & Other	Art Educ.	Vet. Medic.	Art Educ.
10. Status	Political Science	Farming	History Education	Agricultural Science
11. Acquiescence	Business Education	Philosophy	Vet. Medic.	Purchasing
12. Leadership Potential	Speech	Trade & Indust'l Ed.	Speech	Chemistry
13. Literary Potential	English, Creative Wtg.	Trade & Indust'l Ed.	English, Creative Wtg.	Business Education
14. Artistic Potential	Art	Trade & Indust'l Ed.	Other Fine & Applied Arts	Business Education
15. Scientific Potential	Physics	Clerical	Chemistry	Business Education
16. Musical Potential	Music Education	Clerical	Music Education	Gen'l Social Science
17. Dramatic Arts Pot'l	Drama	Trade & Indust'l Ed.	Drama	Business Education

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
18. Range of Experience	Bio-chem.	Modern Foreign Lang.	Other Business & Com'l	Business Education
19. Intellectual Home Resources	Bio-chem.	Theology, Religion	Other Fine & Applied Arts	Accounting
20. Scientific Achieve't	Physics	Clerical; Forestry	Physics	Clerical
21. Leadership Achieve't	Other Health Fields	Trade & Indust'l Ed.	Marketing	Library Science
22. Dramatic Arts Ach.	Drama	Forestry	Drama	Accounting
23. Artistic Achieve't	Art	Chemical Enginr'g	Art Educ.	Exp'l & Gen'l Psychology
24. Literary Achieve't	Literature	Industrial Enginr'g	Journalism, Communic.	Dentistry
25. Musical Achieve't	Music Education	Clerical	Music	Pharmacy
26. Total Competencies	Other Health Fields	Clerical	Law	Library Science
27. Scientific Competency	Zoology	Foreign Lang. Educ.	Physics	Secretarial Science
28. Technical Competency	Indust'l Arts Educ.	Foreign Lang. Educ.	Agricultural Science	Modern Foreign Language
29. Gov't & Soc. St. Comp.	History	Trade & Indust'l Ed.	History	Other Fine & Applied Arts
30. Athletic Comp.	Public Relations	Clerical	Phys. Ed., Recreation	Pharmacy
31. Business & Clerical Comp.	Economics	Astronomy, Astrophysics	Other Business & Com'l	Pharmacy
32. Social & Ed. Comp.	Social Work	Clerical	Drama	Vet. Medicine
33. Homemaking Comp.	Other Health Fields	Philosophy	Home Econ. Education	Political Science
34. Arts Comp.	Drama	Trade & Indust'l Ed.	Drama	Accounting
35. Leadership & Sales Comp.	Journalism, Commun.	Clerical	Journalism, Commun.	Library Science

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
36. Foreign Lang. Comp.	Foreign Lang. Educ.	Trade & Indust'l Ed.	Modern Foreign Lang.	Business Education
37. Precon-scious Act.	Philosophy	Accounting	Drama	Accounting
38. Dogmatism	Other Health Fields	Philosophy	Speech	Literature
39. Academic Type	Astronomy, Astro-physics	Public Relations	Physics	Other Business & Com'l
40. Vocational Type	Metal. Engr'g	Philosophy	Clerical	Literature
41. Non-Conformist Type	Anthropology; Philosophy	Theology, Religion	Exp. & Gen'l Psychology	Medical Technology
42. Collegiate Type	Public Relations	Philosophy	Sales	Vet. Medicine
43. Interpersonal Comp.	Drama	Clerical	Law	Other Health Fields
44. Expected Income	Medicine	Social Work	Law	Housewife
45. Expected Vocational Achievem't	Philosophy	Clerical	Marketing	Pharmacy
46. Highest Level of Education	Vet. Medic.	Military Science	Law	Marketing
47. SR - originality	Art	Military Science	English, Creat. Wrtg	Secretarial Science
48. SR - leadership	Philosophy	Clerical	Drama	Library Science
49. SR - mechanical ability	Mech'l Engr'g	Literature	Agricult'l Science	Library Science
50. SR - popularity	Ind. & pers. Psychology	Clerical	Journalism, Commun.	Physics

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
51. SR - athletic ability	Phys. Ed., Recreation	Astronomy, Astrophysics	Phys. Ed., Recreation	Pharmacy
52. SR - understanding of others	Ind. & Pers. Psychology	Physical Science, Gen. & Oth.	Marketing	Dentistry
53. SR - drive to achieve	Chemistry	Clerical	Vet. Medic.	Library Science
54. SR - math ability	Math, Statistics	Art	Math, Statistics	Theology, Religion
55. SR - scholarship	Philosophy	Clerical; Ed. of Excep. Children	Physics	Clerical
56. SR - sociability	Speech	Astronomy, Astrophysics	Journalism, Commun.	Physics
57. SR - artistic ability	Art	Speech; Mod. Foreign Lang.	Art	Accounting
58. SR - aggressiveness	Drama	Mod. Foreign Lang.	Drama	Accounting
59. SR - speaking ability	Speech	Geography	Speech	Pharmacy
60. SR - self-control	Drama	Geography	Other Fine & Applied Arts	Other Business & Com'l
61. SR - independence	Philosophy	Clerical	Physics; Other Fine & Applied Arts	Library Science
62. SR - scientific ability	Physics	Sales	Physics	Secretarial Science
63. SR - conservatism	Botany	English, Creat. Wrtg	Marketing; Theology, Religion	Exp. & Gen. Psychology
64. SR - practical-mindedness	Economics	Clerical	Other Biological Sciences	General Social Sciences
65. SR - writing ability	English, Creat. Wrtg.	Botany	English, Creat. Wrtg.	Other Health Fields

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
66. SR - expressiveness	Philosophy	Geography	Journalism, Communication	Accounting
67. SR - cheerfulness	Speech	Geography	Law	Physics
68. SR - social self-confidence	Speech	Astronomy, Astrophysics	Journalism, Communication	Physics
69. SR - intellectual self-confidence	Astronomy, Astrophysics	Clerical	Other Fine & Applied Arts	Pharmacy
70. SR - perseverance	Drama	Clerical	Marketing	Pharmacy; Library Sci.
71. SR - popularity with opposite sex	Philosophy	Clerical	Journalism, Communication	Pharmacy
72. SR - research ability	Physics	Public Administration	Physics	Library Science
73. SR - physical energy	Phys. Ed., Recreation	Music	Phys. Ed., Recreation	Library Science
74. SR - sense of humor	Drama	Farming	Journalism, Commun.	Pharmacy
75. SR - physical health	Phys. Ed., Recreation	Mod. Foreign Lang.	Phys. Ed., Recreation	Pharmacy
76. SR - acting ability	Drama	Clerical	Drama	Accounting
77. SR - sensitivity to needs of others	Ind. & Pers. Psychology	Trade & Indust'l Ed.	Theology, Religion	Dentistry
78. G - happy and content	Speech; Public Administ'n	Bio-chemistry	Library Science	Pharmacy
79. G - well-off financially	Public Relations	Theology, Religion	Marketing; Purchasing	Literature
80. G - inventing useful product	Physical Science, Gen. & Oth.	Art Education	Physics	Literature

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
81. G - helping others	Theology, Religion	Anthropology	General Humanities	Other Fine & Applied Arts
82. G - accomplished performer	Drama	Counseling & Guidance	Drama	Library Science
83. G - meaningful philosophy of life	Literature	Farming	Physics	Business Education
84. G - authority on special subject in field	Geology, Geophysics	Counseling & Guidance	Law	Pharmacy
85. G - making parents proud	Geology, Geophysics	Anthropology	Purchasing	Other Biological Sciences
86. G - outstanding athlete	Phys. Ed., Recreation	Mod. Foreign Lang.	Phys. Ed., Recreation	Marketing
87. G - sacrifices for others	Theology, Religion	Anthropology	Theology, Religion	Physics
88. G - community leader	Social Work	Foreign Language Education	Marketing; Theology, Religion	Physics
89. G - influential in public affairs	Political Science	Botany	Law	Agricultural Science
90. G - formal religious code	Clerical	Astronomy, Astrophysics; Philosophy	Theology, Religion	Vet. Medicine
91. G - relaxing & enjoy life	Industrial Engineering	Theology, Religion	Drama	Vet. Medicine
92. G - theoretical contrib. to science	Astronomy, Astrophysics	Sales	Physics	Drama
93. G - technical conbution to science	Astronomy, Astrophysics	Art Education	Chemistry	Drama

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
94. G - writing good fiction	English, Creat. Wrtg	Metal. Engr'g	English Creat. Wrtg	Dentistry
95. G - being well-read	Literature	Farming	Literature	Housewife
96. G - mature & well-adjusted	Ind. & Pers. Psychology	Bio-chem.	Counseling & Guidance	Agricultural Science
97. G - awards or recognition	Drama; Public Relations	Forestry	Drama	Library Science
98. G - self-sufficient	Public Relations	Physical Science, Gen. & Oth.	Pharmacy	Marketing
99. G - good physical condition	Geography	Educ'l Psychology	Phys. Ed., Recreation	Marketing
100. G - good artistic work	Art Education	Math, Stat.; Math educ.; Accounting	Other Fine & Applied Arts	Accounting
101. G - accomplished musician	Music Education	Physical Science, Gen. & Oth.	Music	Education, Gen'l and Other
102. G - expert in finance & commerce	Finance	Astronomy, Astrophysics; Anthropology	Marketing	Zoology
103. G - up-to-date politically	Political Science	Drama	Political Science	Agricultural Science
104. G - being well-liked	Sales	Metal. Engrn'g	Sales	Vet. Medicine
105. G - good spouse	Indust'l Arts Education	Astronomy, Astrophysics	Ed. Psych.; Other Fine & Applied Arts; Library Sci.; Theology, Relig.; Other Busn's & Com.	Physics

Table 17 (cont.)

Variable		Men		Women	
		Highest	Lowest	Highest	Lowest
106.	G - good parent	Ind. & Pers. Psych.; Mod. Foreign Language; Public Administration	Astronomy, Astrophysics; Philosophy	Pharmacy; Marketing; Purchasing; Ed. Psych.; Drama; Oth. Fine & Apl'd Arts; Lib. Science	Physics
107.	G - real purpose in life	Theology, Religion	Astronomy, Astrophysics	Biology; Music	Management
108.	G - active religiously	Theology, Religion	Astronomy, Astrophysics	Theology, Religion	Literature
109.	G - executive responsibility	Marketing	Foreign Language Education	Marketing	Drama
110.	G - avoiding hard work	Other Biol. Sciences	Farming	Theology, Religion	Physics
111.	G - exciting activities	Speech	Farming	Physics	Pharmacy
112.	G - success in own business	Vet. Medic.	Philosophy	Sales	Literature
113.	Psycho-Sexual Status	Philosophy	Modern Foreign Language	Business Education	Physics
114.	Satisfaction with College	Public Admin.	Other Health Fields	Physics	Other Fine & Applied Arts
115.	Consultation with Prof'l Person	Theology, Religion	Modern Foreign Lang.	Theology, Religion	Other Business & Commercial
116.	Finding Suitable Mate	Military Science	Mod. Foreign Lang.	Housewife	Physics
117.	Size of High School Class	Ind. & Pers. Psychology	Farming	Clinical Psychology	Home Econ. Education

Variation Among Major Fields

The determination of the student characteristics with the greatest variation among fields is important for several purposes. Such knowledge reduces the number of student characteristics which we need to use in subsequent studies and identifies the descriptive variables which have practical value. To obtain this information, the results for the 117 descriptive variables were inspected for those variables which had the greatest variation across the 79 male and 60 female fields (the range of major field means divided by the standard deviation for the total population). Generally, the 53 variables with the greatest variation across fields were then retained for a simple analysis of variance. Some variables however were retained for this analysis so that every kind of variable could be sampled. For example, several self-ratings, life goals, and achievement scales were tested for significance, although they did not have great variability across fields.

All results--104 of the 106 analyses of variance--are statistically significant for both sexes at the .05 level. Table 18 presents these results.

Table 18

F-Tests for Selected Student Characteristics Across Major Fields

Variable	Male	Female
1. Realistic	8.2634	3.1393
2. Intellectual	14.9534	13.8275
3. Social	15.6200	9.4283
4. Conventional	20.9428	15.5927

Table 18 (cont.)

Variable	Male	Female
5. Enterprising	13.4959	4.0178
6. Artistic	14.6692	8.5810
9. Masculine	15.2929	14.8763
10. Status	16.5015	5.7575
15. Scientific Potential	20.0021	10.4596
16. Musical Potential	14.8835	6.3076
20. Scientific Achievement	6.6625	5.1840
21. Leadership Achievement	3.7817	3.1049
22. Dramatic Arts Achievement	5.0290	4.6025
23. Artistic Achievement	9.0857	15.9549
24. Literary Achievement	6.3722	8.6520
25. Musical Achievement	9.6726	7.7615
27. Scientific Competency	8.2192	9.9205
34. Arts Competency	9.2788	7.8114
35. Leadership & Sales Competency	4.6765	3.0127
36. Foreign Language Competency	6.9186	10.9722
37. Preconscious Activity (Originality)	14.6986	12.3931
40. Vocational Type	6.4408	6.5426
41. Non-Conformist Type	2.9426	4.5023
44. Expected Income	11.2693	6.9883
46. Highest Level of Education	15.0875	9.3847
47. SR - originality	5.4753	7.4794
49. SR - mechanical ability	9.8215	4.1775
50. SR - popularity	2.8505	2.0469
51. SR - athletic ability	5.3742	8.7586
52. SR - understanding of others	3.1775	2.8114
54. SR - mathematical ability	19.2253	15.1181
57. SR - artistic ability	10.3131	14.9868
59. SR - speaking ability	6.1759	4.3282
60. SR - self-control	1.6377	1.6365
62. SR - scientific ability	23.5377	21.2334
63. SR - conservatism	1.3665	1.7742
65. SR - writing ability	7.0579	12.1473
72. SR - research ability	6.8728	5.9010
76. SR - acting ability	5.1678	4.6327

Table 18 (cont.)

Variable	Male	Female
79. G - well-off financially	3.9867	1.8576
82. G - accomplished in performing arts	10.2835	11.2188
86. G - outstanding athlete	8.2758	11.4284
89. G - influential in public affairs	5.6391	4.1683
92. G - theoretical contribution to science	17.4459	13.1694
94. G - writing good fiction	10.0247	15.9341
98. G - self-sufficient	1.0982	1.2856
99. G - good physical condition	2.3832	2.4671
100. G - good artistic work	14.9914	22.6965
101. G - accomplished musician	14.4689	16.1034
102. G - expert in finance & commerce	21.0044	7.1154
103. G - up-to-date politically	7.2092	4.8572
105. G - good spouse	2.4952	1.8972
108. G - active in religious affairs	3.3960	4.8378

Degrees of freedom
male: 79/6138
female: 60/5938

Significance levels
male: .05 = 1.28; .01 = 1.41
female: .05 = 1.32; .01 = 1.47

If the size of the F ratio is used as an index of the most discriminating variables, then the interest and life goals variables are generally most useful for the characterization of students in different major fields. If we consider different kinds of content rather than kinds of assessment devices, we find that variables of scientific, artistic, and business content are most discriminating.

Discussion

Several cautions should be observed in the interpretation of the

results: Our students are aspirants for various major fields; they are not majors in various fields. The number of students in a given field varied from 10 to 1,353, so that some characterizations are more reliable than others. Finally, the use of the highest and lowest mean scores of the descriptive variables accentuates the characterization of students in various fields. Every field contains probably many students who differ from the typical student suggested here.

The descriptions of students seeking different fields imply, to a limited degree, that students know where they belong. They seek fields which are appropriate for their interests, values, and their special talents. Students with scientific accomplishment, abilities, and interests seek scientific fields and at the same time they avoid fields which demand interpersonal competencies. Similar patterns of attraction and repulsion exist for most of the remaining areas of study. These results make clear that the process of making an educational decision is dependent upon a great range of student characteristics: interests, values, self-conceptions, competencies, achievements, range of experience, and family resources. Such outcomes suggest that students might be helped in their selection of a field of study by a broad self-examination for these same characteristics.

Since large proportions of students who say they plan to enter a field do enter that field, the present results may have some practical value (Strong, 1953). The descriptive variables are easily interpreted and are relatively free of psychological jargon so that it is possible in principle to

develop a self-scoring device which students could take and score themselves without the intervention of a counselor. Perhaps just reading the present report would be helpful to some students. If such simple techniques were constructive, they could serve many students who cannot make use of guidance workers either because they dislike the idea itself, or because counseling staffs are too small to serve all students. Faculty advisors should also find a reading of the present report helpful in their educational advising.

Generally, the characterizations of students seeking different fields is consistent with related studies by Cooley (1963), Davis (1964), Roe (1956), Darley and Hagenah (1955), Holland (1963) and others. Since most studies do not group students in identical fashion, precise correspondence among studies is rare.

In new studies, we plan to develop psychological classification schemes which will be useful for practice and research. The current conventional classifications lack psychological homogeneity so that membership in a group frequently has diffuse and even conflicting meaning. Other studies will be performed to learn how students who persist in a field differ from students who leave a field. In these long term studies we will be able to determine the predictive validities of the assessment devices used in this first study as well as the influence of various college climates upon a student's choice of field.

References

Abe, C., Holland, J. L., Lutz, Sandra W., & Richards, J. M., Jr. A description of American college freshmen. ACT Research Report 01-65. Iowa City, Iowa: American College Testing Program, 1965.

Cooley, W. W. Career development of scientists. Cooperative Research Project No. 436, Office of Education, Graduate School of Education, Harvard Univer., 1963.

Darley, J. G., & Hagenah, Theda. Vocational interest measurement. Minneapolis: Univer. of Minnesota Press, 1955.

Davis, J. A. Undergraduate career decisions. Chicago: Aldine Publishing Co., 1964.

Farber, I. E., & Goodstein, L. D. Student Orientation Survey. Preliminary report, PHS research grant M-226, 1964.

Foote, N. N., & Cottrell, L. S. Identity and interpersonal competencies. Chicago: Univer. of Chicago Press, 1955.

Holland, J. L. A personality inventory employing occupational titles. J. appl. Psychol., 1958, 42, 336-342.

Holland, J. L. Some explorations of a theory of vocational choice and achievement: II. A four-year prediction study. Psychol. Rep., 1963, 12, 545-594. Southern Universities Press, 1963, Monograph Suppl. 4-V12.

Holland, J. L., & Nichols, R. C. Prediction of academic and extra-curricular achievement in college. J. educ. Psychol., 1964, 55, 55-65.

Nichols, R. C., & Holland, J. L. Prediction of the first year college performance of high aptitude students. Psychol. Monogr., 1963, 77, No. 7 (Whole No. 570).

Roe, Anne. The psychology of occupations. New York: Wiley, 1956.

Strong, E. K., Jr. Validity of occupational choice. Educ. Psychol. Measmt, 1953, 13, 110-121.

Trow, M. The campus viewed as a culture. In H. T. Sprague (Ed.), Research on college students. Boulder, Colorado: Western Interstate Commission for Higher Education, 1960.